

2.7 COMPARISON OF ALTERNATIVES

This section summarizes and compares the potential environmental impacts of the No Action Alternative, Alternative A, and Alternative B. As described previously, the waste management actions proposed under all alternatives would be conducted in existing facilities (or, in the case of waste transportation, on existing road and rail lines) by the existing work force over the next 10 years, and would not involve new construction or building demolition. As a result, the scope of potential impacts that could result from the proposed actions is limited. Specifically, because there would be no mechanism for new land disturbance under any alternative, there would be no potential to directly or indirectly impact current land use; biotic communities; cultural, historical, or archaeological resources; visual resources; threatened or endangered species or their critical habitats; wetlands; or floodplains. Additionally, because the work force requirements would be the same under all alternatives (for example, there would be no increases or decreases from current employment levels), there would be no potential for socioeconomic impacts. For these reasons, the potential for impacts under all the alternatives are limited to human health and transportation impacts. Interim storage of TRU waste and HLW at other DOE sites could require the siting, construction, and operation of additional storage capacity for the volume of WVDP wastes to be stored, depending on the storage capacity at those sites at the time. It is recognized that additional review of interim storage impacts at the receiving sites could be necessary prior to implementation of these actions assessed in this EIS under Alternative B.

Table 2-4 summarizes the normal operational impacts under the three proposed alternatives over the 10-year period analyzed in this EIS. Because the proposed waste management actions would involve only the storage, packaging, loading, and shipment of wastes and management options for the waste storage tanks, the proposed activities would result in a statistically insignificant contribution to the historically low impacts of ongoing WVDP operations. As a result, the human health impacts to involved and noninvolved workers and the public are dominated by ongoing WVDP site operations; therefore, there is little discernible difference in the impacts that could occur among the three alternatives.

Table 2-5 summarizes the onsite accident consequences that could result from the proposed actions under each alternative. Chapter 4 provides a detailed assessment of impacts. Under all alternatives, the risk of a latent cancer fatality from the proposed actions that would occur onsite would be less than 1, whether under normal operating conditions or accidents. Offsite transportation of wastes would also result in less than 1 fatality from normal operations and accidents under all alternatives. Under maximum reasonably foreseeable transportation accidents, 1 latent cancer fatality could result under the No Action Alternative and about 3 latent cancer fatalities could result under Alternative A or B.

The WM PEIS (DOE 1997a), the WIPP Supplemental EIS II (DOE 1997b), and the *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE 2002a) analyzed potential environmental impacts associated with management (treatment, storage, or disposal) of LLW, mixed LLW, TRU waste, and HLW, including waste generated and stored at WVDP. Using data extrapolated from these earlier NEPA documents, Table 2-6 shows the potential estimated human health impacts of managing WVDP waste at Envirocare, Hanford, INEEL, NTS, ORNL, SRS, WIPP, and a geologic repository at Yucca Mountain. Appendix C, Section C.10, explains how these impacts were derived.

Table 2-4. Summary of Normal Operational Impacts at West Valley

Impact Area	Unit of Measure	No Action Alternative	Alternative A - Preferred	Alternative B
<i>Human Health Impacts^a</i>				
Public Impacts from Waste Management Activities				
MEI	LCF	0	0	2.4×10^{-13}
Population	LCF	0	0	6.0×10^{-9}
Public Impacts from Continued Operations				
MEI	LCF	3.1×10^{-7}	3.1×10^{-7}	3.1×10^{-7}
Population	LCF	1.3×10^{-3}	1.3×10^{-3}	1.3×10^{-3}
Public Impacts from Combined Actions				
MEI	LCF	3.1×10^{-7}	3.1×10^{-7}	3.1×10^{-7}
Population	LCF	1.3×10^{-3}	1.3×10^{-3}	1.3×10^{-3}
Worker Impacts				
Involved worker MEI	LCF	2.7×10^{-4}	1.0×10^{-3}	1.0×10^{-3}
Noninvolved worker MEI	LCF	2.4×10^{-4}	2.4×10^{-4}	2.4×10^{-4}
Involved worker population	LCF	1.6×10^{-3}	0.024	0.025
Noninvolved worker population	LCF	0.060	0.060	0.060
Total worker population	LCF	0.062	0.084	0.085
<i>Transportation</i>				
Total	Shipments	169 (truck) 85 (rail)	2,550 (truck) 847 (rail)	3,120 (truck) ^b 1,079 (rail) ^c
Impacts (from all causes – radiological and nonradiological; routine and accident conditions)				
Truck	Fatalities	0.030 – 0.037	0.69 – 0.72	0.76 – 0.87
Rail	Fatalities	0.036 – 0.043	0.52 – 0.59	0.62 – 0.78
Maximum reasonably foreseeable accidents				
Truck	LCF (Probability)	1 (5×10^{-7})	3 (6×10^{-7})	3 (1×10^{-6})
Rail	LCF (Probability)	1 (2×10^{-6})	3 (1×10^{-7})	3 (5×10^{-7})
<i>Geology and Soils</i>				
<i>Water Quality and Resources</i>				
Groundwater		No impact	No impact	No impact
Surface water		No impact	No impact	No impact
Wetlands		No impact	No impact	No impact
Floodplains		No impact	No impact	No impact
<i>Noise and Aesthetics</i>				
<i>Ecological Resources</i>				
Threatened and endangered species		No impact	No impact	No impact
Other plants and animals		No impact	No impact	No impact
<i>Land Use</i>				
<i>Socioeconomics</i>				
<i>Environmental Justice</i>				
<i>Cultural Resources</i>				

- a. MEI = maximally exposed individual; LCF = latent cancer fatality (number of fatalities expected or probability).
 b. Includes 270 TRU waste, and 300 HLW, truck shipments from interim storage to disposal. Alternative B would make the same number of truck shipments (2,550) from WVDP as Alternative A.
 c. Includes 172 TRU waste, and 60 HLW, rail shipments from interim storage to disposal. Alternative B would make the same number of rail shipments (847) from WVDP as Alternative A.

Table 2-5. Summary of Accident Impacts^a at West Valley
 (also see Chapter 4)

Accident	No Action Alternative ^b			Alternative A ^b			Alternative B ^b		
	Worker	MEI	Population ^c	Worker	MEI	Population ^c	Worker	MEI	Population ^c
Drum puncture ^d	2.8 × 10 ⁻⁹	1.2 × 10 ⁻⁹	3.8 × 10 ⁻⁶	4.8 × 10 ⁻⁸	2.0 × 10 ⁻⁸	6.0 × 10 ⁻⁵	4.8 × 10 ⁻⁸	2.0 × 10 ⁻⁸	6.0 × 10 ⁻⁵
Pallet drop ^d	1.7 × 10 ⁻⁸	7.0 × 10 ⁻⁹	2.2 × 10 ⁻⁵	2.8 × 10 ⁻⁷	1.2 × 10 ⁻⁷	3.7 × 10 ⁻⁴	2.8 × 10 ⁻⁷	1.2 × 10 ⁻⁷	3.7 × 10 ⁻⁴
Box puncture ^d	3.4 × 10 ⁻⁸	1.5 × 10 ⁻⁸	4.5 × 10 ⁻⁵	4.8 × 10 ⁻⁷	2.0 × 10 ⁻⁷	6.0 × 10 ⁻⁴	4.8 × 10 ⁻⁷	2.0 × 10 ⁻⁷	6.0 × 10 ⁻⁴
Drum cell drop	NA ^e	NA	NA	1.9 × 10 ⁻⁸	8.0 × 10 ⁻⁹	2.5 × 10 ⁻⁵	1.9 × 10 ⁻⁸	8.0 × 10 ⁻⁹	2.5 × 10 ⁻⁵
HIC ^e drop	NA	NA	NA	6.0 × 10 ⁻⁷	2.6 × 10 ⁻⁷	8.0 × 10 ⁻⁴	6.0 × 10 ⁻⁷	2.6 × 10 ⁻⁷	8.0 × 10 ⁻⁴
CH-TRU drum puncture	NA	NA	NA	1.5 × 10 ⁻⁵	6.5 × 10 ⁻⁶	0.021	1.5 × 10 ⁻⁵	6.5 × 10 ⁻⁶	0.021
RHWF ^f fire	NA	NA	NA	5.2 × 10 ⁻⁵	2.2 × 10 ⁻⁵	0.070	5.2 × 10 ⁻⁵	2.2 × 10 ⁻⁵	0.070
Collapse of Tank 8D-2 (wet) ^d	9.6 × 10 ⁻⁷	4.1 × 10 ⁻⁷	1.3 × 10 ⁻³	9.6 × 10 ⁻⁷	4.1 × 10 ⁻⁷	1.3 × 10 ⁻³	Eliminated ^h	Eliminated ^h	Eliminated ^h
Collapse of Tank 8D-2 (dry) ^d	1.6 × 10 ⁻⁶	6.5 × 10 ⁻⁷	2.1 × 10 ⁻³	1.6 × 10 ⁻⁶	6.5 × 10 ⁻⁷	2.1 × 10 ⁻³	Eliminated ^h	Eliminated ^h	Eliminated ^h
Collapse of Tank 8D-2 (grouted) ^d	NA	NA	NA	NA	NA	NA	NA	9.6 × 10 ⁻⁷	4.1 × 10 ⁻⁷
Tank 8D-2 containment system failure ^d	NA	NA	NA	NA	NA	NA	NA	6.0 × 10 ⁻⁶	2.5 × 10 ⁻⁶
									7.5 × 10 ⁻³

a. Based on atmospheric conditions (stability class and wind speed) that are not exceeded 50 percent of the time.

b. MEI = maximally exposed individual; LCF = latent cancer fatality (probability).

c. Collective dose to the 1.5 million people living within 80 kilometers (50 miles) of the WVDP site.

d. Ground-level release.

e. HIC = High integrity container.

f. RHWF = Remote Handled Waste Facility.

g. NA = Not Applicable. Accident scenario could not occur under specified alternative.

h. Under Alternative B, grouting the HLW tanks would eliminate this accident scenario.

Table 2-6. Summary of Offsite Human Health Impacts

Site	No Action Alternative				Alternative A				Alternative B					
	Disposal of Class A LLW ^b		Disposal of LLW ^c and mixed LLW ^d		Disposal of LLW ^c and mixed LLW ^d		Disposal of LLW ^c and mixed LLW ^d		Disposal of LLW ^c and mixed LLW ^d		Disposal of LLW ^c and mixed LLW ^d			
Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	
Envirocare ^a	5.4×10^{-3}	6.9×10^{-6}	NA ^e	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}
	Disposal of Class A LLW ^b	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	
Hanford Site	5.4×10^{-3}	6.9×10^{-6}	NA	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}
INEEEL	No activities					No activities			No activities			No activities		
	Disposal of Class A LLW ^b	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	
NTS	4.8×10^{-3}	3.0×10^{-16}	NA	3.2×10^{-2}	2.1×10^{-5}	NA	3.2×10^{-2}	2.1×10^{-5}	NA	3.2×10^{-2}	2.1×10^{-5}	NA	3.2×10^{-2}	2.1×10^{-5}
ORNL	No activities					No activities			No activities			No activities		

Table 2-6. Summary of Offsite Human Health Impacts (cont)

Site	Action Alternative	Alternative A			Alternative B		
		Interim Storage of TRU waste ^f			Interim Storage of TRU waste ^f		
		Worker	MEI	Population	Worker	MEI	Population
		(LCF)	(LCF)	(LCF)	(LCF)	(LCF)	(LCF)
SRS	No activities	7.4 × 10 ⁻⁴	2.1 × 10 ⁻¹⁰	2.3 × 10 ⁻⁵			
WIPP	No activities	1.0 × 10 ⁻²	3.0 × 10 ⁻⁹	3.0 × 10 ⁻⁶	1.6 × 10 ⁻⁴	6.9 × 10 ⁻⁷	2.6 × 10 ⁻³
Yucca Mountain Repository	No activities	6.8 × 10 ⁻²	3.1 × 10 ⁻⁷	2.0 × 10 ⁻²	6.8 × 10 ⁻²	3.1 × 10 ⁻⁷	2.0 × 10 ⁻²

- a. Impacts of disposal of Class A LLW and mixed LLW at Envirocare are assumed to be similar to impacts at Hanford.
- b. The volume Class A LLW to be disposed of would be 145,000 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- c. The volume of LLW to be disposed of would be 685,515 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- d. The volume of mixed LLW to be disposed of would be 7,889 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- e. NA = Not available.
- f. The volume of TRU waste to be stored or disposed of would be 49,000 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- g. The volume of HLW to be stored or disposed of is assumed to be 300 canisters for purposes of analysis; actual number of canisters is 275.